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SCIENCE

FRIDAY, MARCH 20, 1914

THE PROVINCIAL UNIVERSITY IN CANADIAN DEVELOPMENT¹

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THE problems involved in the development of Canada are not to be compared with those of any other country in the world. Her remoteness from the center of imperial government and her close social and business association with the friendly neighbor to the south, who of necessity can not understand her relations to the mother country, have not served to disturb her poise.

To develop, round out, fuse and nationalize Britain has taken two thousand years. In the making of that portion of Greater Britain, the Briton, the Pict, the Scot, the Roman, the Saxon, the Jute, the Angle, the Norman and even the Spaniard, since the time of the Armada, have been fused, whilst the Jew has furnished an increasingly important strain for the past thousand years. Nor has Germany failed to make her contribution to our highest social and governmental strata. The facilities, however, for rapid nation-building have increased by leaps and bounds, of which the chief is ease of transport and communication.

In the United States, the world has had the opportunity to see the creation of a nation in a day, where the scores of elements have been garnered in the four corners of the earth from those countries whose centuries of growth have brought overcrowding and in some have given birth to intolerable conditions.

In Canada, the same conditions obtain as are to be encountered in the United States, with the difference, however, that the Anglo-Saxon dominates, British tradi-

¹ MSS. intended for publication and books, etc., intended for review should be sent to Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

¹ An address given on the occasion of the inauguration of the first President of the University of Manitoba, at Winnipeg, on November 19, 1913.

tion governs and her law and rule are paramount. Also inevitably Canada must afford ultimate relief from the overcrowding of her older neighbor.

The problem of Britain, Germany or Japan is quite another story. These nations in their growth, as well as others which can be easily called to mind, are endogenous, that is, in them development proceeds from within. In the United States and Canada and those countries which are being populated more largely by the immigration of other peoples than by that natural increase which depends upon birth rate, there is crying need of certain nation-building mechanisms, whose function shall be to secure rapid fusion of bloods, and formulation of common standards which shall serve to develop a people of the highest type. In Canada, the ideas and ideals are grown from British seed and transplanted to new-world soil but must have engrafted upon them an international viewpoint suited to her many peoples in order that the full fruition of Canadian national efficiency may be her contribution to the empire.

This very difference in population assets, which in Britain are fixed and in Canada fluid, is a very real difficulty, although by no means insuperable.

The diffusion of accurate information from each portion of the empire to every other part will enable each of the dominions to effect sufficient modification in British procedure and viewpoint for local needs, without fear of being regarded either as lacking in loyalty or too widely divergent from tradition. Canada's task is that of constructing a nation almost "while you wait," which must, however, be a part of that *supernation* upon which the sun never sets. Hers is a constructive problem. She builds anew and does not have to dwell in chaos amid the litter of

tearing down whilst she rebuilds her whole national fabric. She will therefore do wisely to profit by the experiences of the older nations in order that there may be no need of the uneconomic and tragic task of reconstruction.

In the development of Britain, undoubtedly her peregrinative propensity involved in sea supremacy has been the natural and rational outcome of her geographical position. In this, our parent country affords us the best possible example in the matter of profiting from the experiences of other peoples and the adaptation of their methods to British needs, whilst at the same time she has given to the world British standards of fair play, established justice, and carried law and order into the Seven Seas.

Japan at the present moment is perhaps the most conspicuous example of what a definite coordinated plan of procedure may do in hastening the solution of very real and pressing economic, social and political difficulties, dependent upon increase of population and limited territory. Her sons are models of patriotism in their eager willingness to expatriate themselves for years in order to bring back to Japan those up-to-the-minute scientific and cultural stimuli needed for national metamorphosis. Apparently, she seeks to be the carrying nation of the Pacific, realizing, as Britain did before her, the real power and opportunity which lie in the assumption of such a function.

She is developing an educational system of which her university is an important part. She is training her youth, not only by manning her schools and universities with the best obtainable talent of other countries, but in every land and in almost every university are Japanese who are gladly sacrificing years of their lives in order to bring home what she needs at this critical period. Her amazing success in the

development and maintenance of physical fitness in the avoidance of disease and in the care of her wounded during the Russo-Japanese war startled the world. It is, however, only one of the many examples of the phenomenal advance which has resulted from her most painstaking and patient efforts to carry out, systematically and in detail, a carefully designed and fully matured plan for securing national efficiency.

The value of such a far-sighted nationwide scheme is to be seen in the present most wonderful economic and social revolution which is being effected in Germany. The careful preparation in advance of a program by which the state recognizes and provides education in all its stages and in all its phases, from the highest cultural development to the most practical industrial training, is to be credited with the marvelous progress of this country.

It does not suffice to leave to private effort and volunteer organization the provision of sources of culture and scientific study which may or may not become *directly* related to the practical upbuilding of a people. If the state assumes any responsibility at all for education, scientific research, investigation, cultural development and art, she should coordinate her various mechanisms, and see that all possible avenues are opened for the *direct* as well as the *indirect* benefit of the whole people.

Great Britain, though somewhat late in recognizing that education is apt to lag behind instead of dominating social and industrial relations, is rapidly establishing provincial universities and agricultural and technical schools which are being extended in scope and increased in number. The prestige of having the finest cultural centers in the world without available channels for conveying direct to all the peo-

ple the knowledge of the few, was not meeting her needs.

The development of the state university in the United States and its orientation in the educational system of the commonwealth has been the cause of amazement to the whole world, including some of the older seats of learning in that country itself.

Beginning with Ontario, Canada is developing a system of state or provincial universities. She has every reason to feel proud of those provinces which have taken up this logical and natural as also inevitable function, and no university in America, whether supported by state or private endowment, has developed finer standards or achieved more real success than the University of Toronto.

In order to meet her many peculiar conditions, some of which have been already mentioned, Canada must bring to her work all the help which can be afforded by the other nations of the world. She draws her citizens largely from them. Some of these are capable of adding immediately to Canadian cultural and scientific prestige. Many, however, must be regarded simply as raw material, brought to Canada for the purpose of their individual and collective improvement.

To hasten the process of Canadianizing them and to derive the greatest national profit from the best and the worst in the shortest possible time are most important.

If we are not satisfied to wait until the second or third generation for results, we must provide leaders who know conditions in both lands. The best brains of their countries may be used to leaven our land. They and Canada's strongest sons who have been trained in both lands are needed in our universities and schools.

The example of Japan in this matter is worthy of our emulation if we are to take and keep our place with other nations and

bring to the empire what she has a right to expect.

There is no one force which can do more in this important undertaking than the provincial university when properly articulated with the other educational units of each province, if these resulting provincial systems are properly coordinated and organized into a workable national mechanism.

CONSERVATION OF NATIONAL RESOURCES

It is most important that we appreciate our responsibilities for the heritage which has been given us. We must not be intoxicated by the realization of nature's prodigality. In the exuberance of our youth, we must not sow national wild oats for our children and children's children to reap.

We must conserve our national resources intelligently, which means that we must use and not abuse nature's gifts to us. We can well take warning from the experiences of the United States, where it is being found necessary to hold annual conservation congresses, one of which is now in session at Washington, D. C. At this congress, forest conservation will receive first attention, the desire being to specialize on some one phase of the conservation program at each meeting, for the purpose of achieving more lasting results. In the call issued for this congress, the following announcement is made:

The fifth National Conservation Congress is to be devoted largely to forest conservation, because of the national importance of the subject in its many phases. Public interest is involved, because upon the proper solution of the various problems depends the cost of the wood without which our civilization would decline; the perpetuation of the timber supply; the development of hydro-electric power; the utilization of non-agricultural lands; the availability of water for irrigation; the preservation of forest areas for health and recreation; and many other developments essential alike to

every citizen from the lumberman to the man who owns neither a tree nor a foot of land.

The congress will endeavor to diffuse more information and develop better methods for the prevention of forest fires which cause such tremendous loss of life and of property valued at over fifty million dollars annually, and which also damage the soil, the water and the young timber growth. The study of forest insects is important, since they destroy enough timber every year "to finance the construction program of the navy." The relation of floods to forest denudation, which is in part responsible for the disasters of the current year, will be studied.

The need of knowing exact conditions so as to avoid the use each year of three times the annual timber growth is apparent, particularly when we realize that only forty to seventy per cent. of each cut tree is utilized, while fires are destroying annually the equivalent of this growth. The use of preservatives for the treatment of wood with the view of prolonging its life when used in constructive work is important because through it we have promise of reduction in forest consumption and the possibility of increasing supply by utilizing inferior species of woods at present not available. Another object of the congress is to meet the need on the part of the public for a safe national forest policy against which there seems to be strong opposition.

These details are cited, not because they constitute Canada's most important national waste, but because it is the one which at this moment is receiving recognition and study by our neighbors.

The conservation of the soil elements, the utilization and preservation to the people of water powers, mineral wealth and above all, that chiefest national asset, the public health and human vitality, surely constitute a present-day responsibility, if the

Canada of the future is not to curse the Canada of to-day.

Our land is full of opportunity. Our spaces are wide. Citizens of less fortunate countries, which have wasted their opportunities and shirked their responsibilities until too late, have turned their eyes towards Canada.

Canada has a right to expect, both from her own and her foster children, that they shall use but not abuse their unrivaled chances for national and world betterment. We shall be wise if we see and provide in time the proper mechanisms for harmonizing rapid development with proper conservation of resources before we are fighting for the room and the right to breathe by reason of our overcrowding when we should be unable to think clearly and act intelligently and realize too late that in our short-sightedness we have made unwarranted overdrafts on nature's storehouse.

Facilities for rapid transit and free communication have enabled Canada to have at her command, while she yet has room, all the equipment evolved by the older and more crowded nations. Pioneering in the year 1913 is indeed "*pioneering de luxe*." This, whilst a matter of self-gratulation for increased opportunity, brings also added responsibility to our generation.

The necessity for the provision of national and provincial facilities for seeking out, accumulating, weighing, standardizing, adapting and diffusing knowledge require no argument: in fact, the newer provinces in the middle and far west have already anticipated this need and we are now met to celebrate an important step in the development of our prairie province from whose ample bosom is derived that sustenance upon which so many in this and other lands have come to depend.

The Canadian government has not been blind to the value of such knowledge to the

people. The provision of a fund of ten million dollars to be distributed throughout the Dominion for the benefit of agricultural instruction is a splendid national investment. This far-sighted policy under the direction of such wise leaders of Canadian progress as Dr. C. C. James, will bring much that is needed, not alone to the agricultural interests, but to all of us.

SCOPE, VALUE AND COST OF PROVINCIAL UNIVERSITIES

In the consideration of the function and scope of a provincial university, we should carefully consider the end sought, the benefit to be derived, the means available and the cost of installation and operation. At the present day we are not staggered when confronted with the necessity of spending hundreds of millions of dollars on railways, whose construction is necessary to open up new lands. We pledge our own generation and our children to the payment of vast sums for advantages which sometimes remain problematical for years. We see the need for tremendous capital investment in the matter of mines when sometimes many years elapse before production yields satisfactory dividends. The dividends to be paid by our educational system are not all to be expressed in terms of dollars and cents, but they are sufficiently obvious to induce those states which have had most experience to invest more deeply every year.

I had the honor to deliver the second annual opening address before the faculty of science of the University of Manitoba in October, 1907, at which time I spoke upon "State Responsibility in University Education." On that occasion I gave the available figures for capital and maintenance expenditures in certain of the state institutions in the mid-western portion of the United States. At that time, Wisconsin

was spending for all purposes something over one million dollars per annum. Minnesota's outlay for current expense was over \$650,000 per annum. Illinois had available considerably over two million dollars for all purposes for the biennial period.

Only six years have elapsed and yet for the current year 1913-14 there is being expended by each of the three state universities—Minnesota, Wisconsin and Illinois—in round numbers, two million dollars per annum for current expenses, which excludes not only building, but equipment outlay. This increase of approximately three hundred per cent. in six years in expenditure undoubtedly would not be made were it not for the fact that those three states are convinced that they are receiving satisfactory dividends on those combined annual outlays of over six million dollars. That they are being repaid in many more directions than they realize during those early years seems likely, because in the modern university, as in a railroad or other important public utility, the initial cost of installation and operation, as also of extension, must inevitably be very much higher in relation to efficient service than in later years.

For the proper fulfillment of her function of developing leadership in every phase of social and economic development, the provincial university must of necessity keep pace with all human knowledge and add her share to the sum total. When we remember the additions which have been made to our armamentarium in our own generation, we shall be prepared to plan generously for the future.

It requires no mental effort, however, to understand that in order to prepare as well the youth of to-day to meet his responsibility as we were prepared to meet ours, a greater range of teaching and experience must be provided because of the added knowledge of one generation.

The standpoint of the youth of to-day is not very different from that of our own. He believes that his capacity is greater and his viewpoint wider than those of the preceding generation, just as we unblushingly admitted our superiority over our predecessors. Even admitting his increased mentality for the sake of argument, we realize that the youth of to-day can not avail himself of all of our sources of information as well as those which have been discovered since his time. Notwithstanding the increase of human longevity, we are not yet warranted in insisting that thirty or more years be expended in preparation for an active working period of a like term.

Nevertheless, universities must maintain all the departments of real knowledge which were available to earlier generations whilst developing those of importance to the present and coming generation. If she is to be the chief mechanism for the diffusion of knowledge, she must be the leading explorer in unknown fields in order that our stock of knowledge be increased. Upon her rests the responsibility for finding out and bringing over from older and other lands, all that is worth while. She, too, must take a leading place in the investigation of local resources and develop methods for their more intelligent utilization. Thus each province will come to know the resources of other lands and of other provinces and at the same time be in a position to afford exact information and the best possible service to others who need what she has to give.

Canada needs experts in special lines, some of which deserve mention.

HOUSEHOLD ADMINISTRATION, HOME ECONOMICS AND DOMESTIC SCIENCE

These are terms with which we are all familiar and indicate that this generation is waking up to the need of special train-

ing for the most important work in nation-building. The successful making and keeping of the home is indeed a profession which requires the most careful training of women of the best moral fiber and the highest mental equipment. The housekeepers of our land are those who perhaps spend the bulk of the nation's money. Yet in the past there has been little in the way of careful training for this most important economic work. The home-keeper is not less important in our social development. We leave to our women very many non-descript duties included in the care of the home. She it is who knows all details of the children's physical and intellectual progress. She has accurate information about our schools. To her we turn when problems of civic house-cleaning and house-keeping arise through man's negligence. It is, therefore, most appropriate that at length we are providing practical as well as cultural training in order to enable woman to meet some of her obligations.

Universities must train our leaders in women's work and provide facilities for research in the science of home-making and the art of housekeeping, if the word "*home*" is to remain current in the Canadian vocabulary, and this most important phase of our national life is to keep abreast of commercial and industrial progress.

AGRICULTURE

In agriculture we have many problems which are of tremendous importance and interest. The fascination of studies which may lead to the growth of two stalks of wheat where one grew before, of a head which has a double number of grains of the same size, or the same number of grains of double size or a strain which improves quality without impairing quantity, or is adapted to land which was formerly unprofitable or useless, can not fail to arouse

national and even international interest since it concerns the food supply of the world. Such studies as those which resulted in the production of the Marquis wheat in Canada, or the work of Hayes in Minnesota wheats, or of Zavitz of Guelph on barleys, have meant millions upon millions of dollars to the new world and food for the nations. The expeditions to Asia of Hensen, of South Dakota, in the search for, and development of, alfalfa suited to cold winters and dry summers brought about an economic revolution and furnished a story as fascinating as is to be found in literature. Babcock and Russell have added millions annually to Wisconsin's assets through their contributions to the making of cheese, butter and other milk staples.

However, these are only a few of the rural problems where scientific, patient work, and wide propaganda are needed. Humanity is traveling cityward and the best of our peoples must have their faces turned again to the country, if we are not to suffer disaster. This means that rural life must be made possible. It must become a life and cease to be an existence. Toward this end every influence in our provinces and in our land must be brought to bear, but it is quite as much a social as an economic question. It includes cultural and artistic phases quite as much as scientific agriculture and the food supply. It also must not lose sight of rural hygiene.

In our land we have many problems which relate indirectly to the soil, and we realize at once that we must develop agriculture as a profession comparable in all respects to other professions. For this work, undoubtedly, we must also develop an artisan class with industrial training just as we must take pains to foster the teaching of other trades and callings.

It is to be hoped that all our universi-

ties will bring every influence to bear to establish anew the dignity of labor. It must be confessed at the present time that Canadians, like Americans, are abandoning manual work as fast as they can to newcomers from Europe and Asia. Either the creation of a peasant class must be squarely faced at this time or the dignity and the vital need of labor must be duly impressed on Canada's native sons. We must return to the ways of our fathers. We must all work if we would be strong, and we must be strong if we would work.

FORESTRY AND FOREST ENGINEERING

The need for the study of forestry and of horticulture is becoming better recognized. Wisconsin has a forest-products laboratory built by the federal government and maintained by the state university, in which such problems as those which are now engaging the attention of the Fifth National Conservation Congress are studied. Every one interested in agriculture needs to know about shelter belts, the care of fruit trees and kindred subjects. Not only for forestry in relation to agriculture but for forest engineers there is an increasing demand. In such countries as British Columbia, the provincial government needs them for the proper conservation and intelligent use of its forest resources, and the Dominion government for its large timber holdings, whilst the transcontinental railways have in their possession vast forest tracts.

The important corporations whose operations are extensive in lumbering industries will need men who are trained in botany, animal biology, chemistry, physics, mathematics, engineering, economics and commerce, in order that they may fulfil those functions which they may reasonably be called upon to perform.

ENGINEERING, ARCHITECTURE, MINING AND COMMERCE

In Canada pioneering has spelled engineering. We lay out and build roads and railroads, construct bridges, tunnel mountains, discover, measure and harness water powers, prospect for and produce from mines, and in every way possible explore and develop our country, realizing at the same time that as yet we have not well begun. We have to develop our resources and facilities for our own use and also in order that we may exchange our commodities with other nations. Chemistry, physics and biology have all to be utilized in our manufacturing processes in increasing degree. Our people have to be housed and so have our industries, we and our products have to be transported. We must fetch to and carry from other nations. Naval architecture and building must be improved even yet. Markets and marketing require most careful investigation and report. Business needs to be put on the plane of a profession and in our universities, pulpits and forums, only one brand of ethics need be taught. The golden rule brought down to date will serve this and many other generations.

For all these activities we must busy ourselves in training men. Our universities need no longer argue the question of whether college men can "make good" in the practical walks of life. The people want more of them. That is why they are providing the provincial and state university with departments, schools and colleges to develop these branches.

LAW

Pioneering is the struggle with nature, the fight with things, the adjustment of the rest of the world to man. As soon as we arrive at the stage when we touch elbows—begin to be "civilized" forsooth—we have

need of the lawyer to help us adjust man's rights to mankind's needs. We do wisely if we train these men carefully who are to compose our difficulties, lest they only stir up strife where they should be strenuous for peace. We expect them to be the leading force in developing society by making the individual conform to the mass. They must therefore be men of the highest integrity and trained most broadly. They need a knowledge of what has gone before. They need all the cultural training available and they most certainly need some information in regard to the sciences if they are to be intelligent in the making and interpretation of laws which are intended to crystallize our most advanced thought and fix common procedure.

The preceptor system is ideal when the student is articulated to one who can and will teach and who feels at once his opportunity and his obligation. It is, however, as unreliable as it is antiquated, and is antiquated because it is unreliable. It belongs to the dark ages when public schools and compulsory education were unknown. Whilst medicine has taken many liberties with pedagogical principles, she has long ago given up the apprentice system, and of recent years has introduced modern teaching methods into her schools. Law must inevitably follow. The public will doubtless develop state mechanisms for training our lawyers, who have meant and must continue to mean so much to British progress and national stability. British law is the pride of the empire.

MEDICINE AND ALLIED BRANCHES

The people realize in increasing degree that the provision of better physicians and nurses for their children is the best possible public investment, a form of life insurance that is safer than any other. They understand that it is the people's business

to provide adequate training and to insist that those who are to be entrusted with the lives and welfare of our citizens avail themselves of that training and present satisfactory evidence of proper qualification for their work. Medicine is being increasingly socialized. We are drifting perceptibly nearer to the time when the doctor will be a public servant and not a member of a privileged class. It is therefore only just and right that he be trained at public expense. This means provision not only of biological, chemical and physical laboratories, but laboratories of medical science, clinical laboratories, hospitals, dental infirmaries, dispensaries, nurses' homes, and other such facilities, all as a part of the equipment of a provincial university.

The expense of such an undertaking should properly be assessed not alone against the university, however. It is a good public investment when the by-product more than pays the total cost of operation. The teaching hospital, the backbone of such a university school of medicine, by returning to the community from which the patient comes a self-supporting and independent citizen in lieu of a helpless being—a burden to himself and others—is far more than paying the cost of maintenance. In fact, the cost of operating the hospital and its associated laboratories should really be charged not to education, but to public works, not to life insurance for our children, which medical teaching means, but to current provincial business, which increases the earnings of to-day. We are learning to know that in fairness both to the sick who can not work, and to the well who must work, the place for the sick is in the hospital. The sick can not receive such kind and efficient care at home whilst the amateur nursing and household disturbance both interfere with the work and reduce the vitality of the well.

PUBLIC HEALTH AND SANITATION

To provide for medicine is not to meet the needs of public health. Its conservation involves phases of medicine, engineering, law-making and enforcement, sociology, economics, education and many other lines of endeavor. The construction of the Panama Canal, that marvel of engineering, has been possible only because at length man has been able to stay the hand of the grim destroyer. The annual death toll under the De Lesseps regime was one out of each ten. It is now less than one out of each hundred amongst the white employees in the canal zone.

The same forces of nature which science has tamed for man's use and pleasure, the biological and physical sciences, have been applied in the war with disease. Death can be postponed and man's working period lengthened. Man was in sad need of improved weapons for his own defense in view of the rapid multiplication of complexities developed by modern life which masses thousands together in a few minutes and as quickly disperses them. *Velocitania*—speed craze—is the microbe's friend, whilst our high tension life gives him the needed hold by increasing vital waste. In turn, hygienic success and extension of man's active period means increased population and adds new problems to the many perplexities of the engineer, the architect, the sociologist, the economist and the statesman. And so we are mutually helpful and mutually harmful.

We have come to recognize that the individual's fitness is not only his prime business but the public's affair as well. In increasing degree are we interfering with personal liberty for the benefit of the race. In line with this tendency we must undoubtedly expect to see colleges and schools of public health, as differentiated from medical schools, developed in our state uni-

versities. They can only succeed by enlisting all official and volunteer public health agencies in the training of workers for the many fields in which specialists are required. They involve so much of basic science and culture that they can be developed only in universities and will be most successful in state or provincial or federal universities. The members of the teaching corps are already available if we add the trained workers in official and voluntary public health services, who can furnish the practical work which in the language of the medical school might be termed "public health clinics."

It is time that all those who are charged with responsibility for the care of the public health be trained before they undertake that responsibility rather than to receive their training at the expense of the public welfare. This the public realizes and will demand.

PEDAGOGY

With the advance in professional and industrial education has come a very real need for teachers' colleges which can not be met by our normal school system. Their proper home is in our universities since they require on their staffs the very men there available. They must be taught to know and then to teach. We must teach teachers of domestic science the mechanic arts, agriculture, nursing, personal hygiene and many other lines of work. These embryo teachers must have their practise schools to learn under proper direction the art of teaching. A nice articulation must be made, however, in order to see that in our educational system there is neither uncovered ground nor undue overlap. The need of training drilled public servants available for permanent positions in a stable profession is so overwhelming that there is little present danger of overlap.

THE NEED FOR TRAINING PROFESSIONAL COORDINATORS

Life is a continual fight with physical, biological and social environment. In the struggle man has gradually acquired a composite equipment. As in the process of evolution from single celled organisms to the higher animals there is loss of cell versatility and acquirement of very special function on the part of cells, cell groups and systems, so in the social organism development has come about. We have come far and are going farther towards specialization. Our increase in aggregate knowledge has come by this very specialization, yet whilst this gives each of us more power in his own sphere it makes him increasingly dependent upon others. The more knowledge we acquire in our own field, the less we are apt to have in our neighbor's. Inevitably we shall become incapacitated from over-specialization unless we develop our "*social nervous system*" to a corresponding degree. Our problems become more largely governmental. We need professional coordinators; we require those who can comprehend and compel cooperation. We have come to the point in our development when we must have trained statesmen, publicists, journalists, social experts, public hygienists, lawmakers, and last, but not by any means least, spiritual advisers and leaders. As man gets to know more about himself and his environment, and learns to control in increasing degree the forces of this world, he does not lose interest in the question of whence he came and whither he goes. He needs to be understood and helped whilst here, however. We begin to see more clearly the relation between disease and morality, between poverty and crime and between poverty and sickness. We know that physical efficiency is inexplicably interwoven with mental and moral vigor. We

appreciate better each day the unrighteousness of ignorance and of disease, as well as of doing less than one's best.

LITERATURE, THE ARTS AND SCIENCES

Mention of these has been reserved till now because of the obviousness of their place in any scheme of university development. At no very recent date they largely constituted the college and university curricula, with the exception of science, which has only become respectable in Cambridge within a generation and is now being tolerated in Oxford. We can not so well develop agriculture and other industrial activities which involve science and culture independently of them, since their ramifications interdigitate with and involve all our social and economic functions. These interrelations are so self-evident that no argument is needed in support of the claim for increase in efficiency and the decrease in effort and expense which result from a policy which coordinates these branches and provides a system of vital checks and balances. Home management, agriculture, forestry, engineering, architecture, mining, manufacturing and commerce, medicine, law, public health and all such practical workaday phases of our national life are rooted in the arts and sciences. They presuppose the culture of the humanities, a familiarity with the fine arts, a foundation in the life and literature of the past, a knowledge of current events in this and other lands and the possession of linguistic and other such tools. They are the more practical application of biological, physical and social sciences to the betterment of man in order to place him *en rapport* with his environment and adapt his environment to his requirement as well as to adjust the rights and obligation of man to the needs of mankind and the will of his Creator.

To divorce literature, science and the

arts from the crafts, the industries and the professions is unthinkable. The dreamer needs the doer, the artist needs the artisan, the poet needs the planner, the scholar needs the statesman. The man with the telescopic eye, who sees so clearly the things of to-morrow, but trips over the threshold of to-day, needs the social myopic whose condition results from too close and too prolonged contact with the minute work of the world. One warns the other of things to come whilst he in turn is protected against the dim dangers of the day. The so-called practical men need theory, and the theorists need practise. The workers need uplift and the apostles of culture need contact with the earth. The people's university must meet *all* the needs of *all* the people. We must therefore proceed with care to the erection of those workshops where we may design and fashion the tools needed in the building of a nation and from which we can survey and lay out paths of enlightenment, tunnel the mountains of ignorance and bridge the chasms of incompetence. Here we will generate currents of progress and patriotism while we prepare plans and begin the construction of a finer and better social fabric than the world has known. Having done our best to found provincial universities without provincialism, let us pray that posterity may say of us that we builded even better than we knew.

It's the olden lure, the golden lure, it's the lure of the timeless things.

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THE INDIAN LADDER RESERVATION

GEOLOGISTS in many parts of the world will be interested in the announcement recently made of the gift to the state of New York as a public park of the "Indian Ladder" and its

adjoining portions of the Helderberg mountains escarpment in Albany county, New York. Next, perhaps, to the Schoharie Valley, the Helderbergs and the Indian Ladder have the most intimate and ancient association with the history of geology in this state and are really a classic ground in American geological science. Interesting not alone for its geology, as the original section of the "Helderberg formation" and its various subdivisions, with their profusion of organic remains, the Indian Ladder is equally commanding as a scenic feature. There is perhaps nothing just like it in origin and effectiveness. From the summit of the long sheer limestone cliff the eye commands the panorama of the conjoined Hudson and Mohawk Valleys picturesquely spread out over a vast area bounded at the north by the foothills of the Adirondacks and at the northeast by the Taconic mountains and the Berkshires. And over this splendid picture generations of geologists have gazed, for the Helderbergs have been the Mecca of geologists for well nigh a century.

The generous gift to the people of New York State comes from Mrs. Emma Treadwell Thacher, widow of the late Hon. John Boyd Thacher, a distinguished statesman, historian and litterateur. Its more than 350 acres extends along the escarpment so far as to include all its most striking portions and the new reservation is essentially a geologic and scenic park. It was the intention of Mr. Thacher that it should have this ultimate disposition. Mr. Thacher, who had a summer home in the Helderbergs, was much in Europe engaged in his historical researches. On one of his returns he told me that he had heard so much of the Helderbergs, their rocks and their fossils, among circles of savants with whom he was thrown that he determined to do his part to preserve this famous cliff from any danger of invasion, because of its natural beauty and extraordinary scientific interest. Impressed by the worth of preserving such natural monuments, Mr. Thacher's high-minded purpose has now been made effective.

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